

Effect of Ionizing Radiation (Cont.)

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Tsetlin, B.L., Yanova, L.P., Sibirskaya, G.K., Korbut, V.M.  
Effect of Ionizing Radiation on the Mechanical Properties of  
Polyvinyl Chloride and Its Plastics

354

Polyvinyl chloride undergoes vulcanization due to the effect of hard radiation. The changes in mechanical properties result from the formation of a three-dimensional lattice and the occurrence of multiple inner micro-defects (due to gas formation). Polyvinyl chloride base plastics also undergo radiation vulcanization. The rate of the process decreases with the increase of the plasticizer content. There are 5 figures, 1 table, and 16 references of which 10 are Soviet, 3 German, and 3 English.

Tsetlin, B.L., Zaytseva, N.G., Korbut, V.M., Kargin, V.A.  
Effect of Ionizing Radiation on Vitreous Polymers

362

This paper reports an experimental study of radiational destruction of vitreous polymers: changes in the thermo-chemical properties, gas formation, dendritic fissures. The modifying factors are: the stabilizing effect of aromatic groups, greater probability of bond rupture in the main chains of macromolecules due to the presence of tertiary

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carbon atoms in them, decrease in the rate of radiation destruction of polymethylmethacrylate and its analogs with increase in the size of side groups, intensification of the destruction process in the presence of low molecular weight plasticizers. The fissure formation is interpreted as having an adsorption-type mechanism. The process of radiochemical conversion of plexiglass is regarded as irreversible. There are 8 figures, and 27 references of which 11 are Soviet, 14 English, and 2 French.

PART 5. EXPERIMENTAL METHODS

Breger, A.Kh., Belynskiy, V.A., Karpov, V.I., Prokudin, S.D. Equipment for Radiochemical Research. Part 2. Equipment Supplying Doses of up to 300 Roentgen/Sec in 30 ml and up to 100 Roentgen/Sec in 1 Liter, From a  $\text{Co}^{60}$   $\gamma$ -Radiation Source With an Activity of 1400 Radium Gram-Equivalent

380

The first part of this paper gives general considerations on the features of units with  $\text{Co}^{60}$   $\gamma$ -radiation sources used in radiochemical research. Further, details are given on the new unit K-1400 (improved K-300) which supplies doses of 300 roentgen/sec in 30 ml and 100 roentgen/sec in 1 liter using three standard  $\text{Co}^{60}$

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sources with a total activity of 1440 radium Gram-equiv. A method was developed for safe, "dry" assembling of powerful sources from smaller standard cobalt charges. The K-1400 proved itself efficient safe during one year of operation. There are 6 figures and 22 references of which 9 are Soviet, and 13 English.

Glazunov, P.Ya., Radziyevskiy, G.B. Equipment for the Application of 1 Mev Accelerated Electrons in Radiochemical, Radiobiological, and Other Research Work

395

This paper describes some instrumentation developed and used in the laboratory for working with 1 Mev electrons and X-rays. The accelerator generates continuous and pulsed electron and hard X-ray radiation. The electron flux is measured by means of an ionization chamber (fig. 2). The distribution of electron-flux density is determined by means of densitometers (fig. 7). Directional control of the beam for vertical or horizontal irradiation is achieved by means of a magnetic system (fig. 8) and automatic stabilizing device (fig. 9). Pulse technique with given duration and intervals was achieved with the aid of a pulse regulator (fig. 10).

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Generation of single pulses of relatively long duration is done by means of a rotating shutter (fig. 12) efficient in the range from 10 millise. to 2 sec. Wider versatility of the high-voltage electron accelerator tube was gained by the introduction of a gold target for the generation of hard bremsstrahlung (fig. 13). The X-ray radiation is measured by means of an ionization chamber made of a plastic and lined with aluminum foil. There are 13 figures, and 4 references, 1 Soviet and 3 English.

Zatulovskiy, V.I., Naryadchikov, D.I. X-ray Equipment as Radiation Source for Radiochemical Research

The Laboratory of Radiochemistry at the Institute of Physical Chemistry of the USSR (IFKh AN SSSR) developed two types of X-ray apparatus for research purposes. The apparatus and control instruments are described in this paper. The units are: ARKh - 200 (fig. 1) and ARKh - 100 - 20 (fig. 5). There are 7 figures and no references.

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AVAILABLE: Library of Congress

Card 51/31

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YEMEL'YANOV, V.S., otv.red.; BARDIN, I.P., red.; VINOGRADOV, A.P., red.;  
 GOL'DANSKIY, V.I., red.; GULYAKIN, I.V., red.; DOLIN, P.I., red.;  
 YEFREMOV, D.V., red.; KRASIN, A.K., red.; LEBEDINSKIY, A.V., red.;  
 MINTS, A.L., red.; MURIN, A.N., red.; NIZE, V.E., red.; NOVIKOV,  
 I.I., red.; SHMENOV, V.F., red.; SOBOLEV, I.N., red.; BAKHAROVSKIY,  
 G.Ya.; nauchnyy red.; BERKOVICH, D.M., nauchnyy red.; DANOVSKIY,  
 N.F., nauchnyy red.; DELONE, N.N., nauchnyy red.; KON, M.A.,  
 nauchnyy red.; KOPYLOV, V.N., nauchnyy red.; MANDEL'TSVAYG, Yu.B.;  
 MILOVIDOV, B.M., nauchnyy red.; MOSTOVENKO, N.P., nauchnyy red.;  
 MURINOV, P.A., nauchnyy red.; POLYAKOV, I.A., nauchnyy red.;  
 PREOBRAZHENSKAYA, Z.P., nauchnyy red.; RABINOVICH, A.M., nauchnyy  
 red.; SIMKIN, S.M., nauchnyy red.; SKVORTSOV, I.M., nauchnyy red.;  
 SYSOYEV, P.V., nauchnyy red.; SHORIN, N.A., nauchnyy red.;  
 SHREYBERG, G.L., nauchnyy red.; SHTEYNMAN, R.Ya., nauchnyy red.;  
 KOSTI, S.D., tekhn.red.

[Concise atomic energy encyclopedia] Kratkaya entsiklopediya  
 "Atomnaya energiya." [\_\_\_ Tables of isotopes (according to published  
 data available at the beginning of 1958)] \_\_\_ Tablitsa izotopov (po  
 dannym, opublikovannym k nachalu 1958. 12 p. Gos. nauch. izd-vo  
 "Bol'shaya sovetskaya entsiklopediya," 1958. 610 p. (MIRA 12:1)

1. Sotrudniki Bol'shoy Sovetskoy Entsiklopedii (for Bakharovskiy,  
 Berkovich, Danovskiy, Delone, Kon, Kopylov, Mandel'tsvayg, Milo-  
 vidov, Mostovenko, Murinov, Polyakov, Preobrazhenskaya, Rabinovich,  
 Simkin, Skvortsov, Sysoyev, Shorin, Shreyberg, Shteynman).  
 (Atomic energy)

SOV/30-58-10-3/53

AUTHORS: Bakh, N. A., Dolin, P. I., Doctors of Chemical Sciences

TITLE: Radiation Chemistry, Its Basic Methods and Tasks (Radiatsionnaya khimiya, yeye osnovnyye napravleniya i zadachi)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 10, pp 20-33 (USSR)

ABSTRACT: The authors give the most important methods of modern radiation chemistry, examine their stages of development and discuss their future tasks:  
Transfer of the radiation energy on the surroundings, elementary acts of radiation and primary chemical processes.  
The transfer of radiation energy upon the surrounding molecules depends on the laws governing the interaction between radiation and the material. The theory of energy transfer has only been developed for gases. For the clarification of the process of chemical reaction under radiation, methods of mass spectrometry, of para-magnetic resonance, of spectrometry and others are employed. In the Soviet Union V. L. Tal'roze, N. I. Tunitskiy, and V. V. Voyevodskiy work in this field (Ref 4).  
Chemical reactions under radiation of simple inorganic substances.

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Radiation Chemistry, Its Basic Methods and Tasks

SOV/30-58-10-3/53

These reactions can be most easily explained with examples as the ozone formation, nitrogen oxidation, formation and decomposition of hydrogen peroxide and others. S. Ya. Pshezhetskiy works on this in the USSR (Ref 5).

Chemical reactions under radiation in water and aqueous solutions.

Many papers deal with this problem, as water is being used as moderator and cooling agent in atomic reactors. M. A. Proskurnin and his collaborators are concerned with this problem (Ref 8).

Electro-chemical processes under radiation.

V. I. Veselovskiy (Ref 9) discovered that the irradiation of an electro-chemical system leads to an interference with the thermodynamic equilibrium in that system. In their studies N. A. Bakh and V. I. Medvedovskiy (Ref 10) established the usefulness of electro-chemical methods for the examination of radiolysis products in aqueous solutions.

Research in the field of radiation chemistry of organic compounds.

Because of the complexity, no final results have been achieved.

Valuable results were obtained by V. L. Tal'roze, Ye. P.

Frankevich (Ref 11), A. V. Topchiyev, and L. S. Polyak.

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Radiation Chemistry, Its Basic Methods and Tasks

SOV/30-58-10-3/53

Radiation polymerization and chemical transformation of polymers under radiation.

In the USSR S. S. Medvedev (Ref 13) carried out systematic research on radiation polymerization. Radiation effects on polymer materials were dealt with by V. A. Kargin and P. A. Rebinder (Ref 14) and are presently studied by V. L. Karpov, B. L. Tsetlin, Yu. S. Lazurkin, and others (Ref 15). The practical application of the chemical transformation of polymers under radiation is only about to be realized.

Radiation effects on solid substances.

There are only very few such studies in the USSR and abroad.

There are 15 references, 13 of which are Soviet.

Card 3/3



DOLIN, P.I., doktor khimicheskikh nauk

Effect of ionizing radiations on aqueous solutions of inorganic  
compounds. Khim.nauka i prom. 4 no.4:516-521 '59. (MIRA 13:8)  
(Radiochemistry)

5 (4), 5(2), 21 (8)

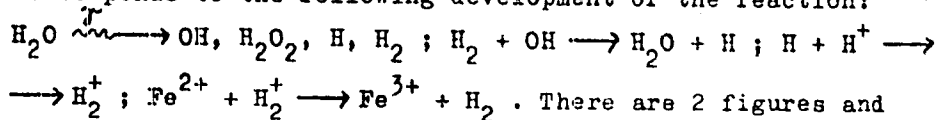
AUTHORS: Shubin, V. N., Dolin, P. I.

SOV/20-125-6-35/61

TITLE: The Oxidizing Properties of Atomic Hydrogen in the Oxidation of Bivalent Ferrous Ions by Radiation (Okislitel'nyye svoystva atomarnogo vodoroda pri radiatsionnom okislenii ionov dvukhvalentnogo zheleza)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1298-1300 (USSR)

ABSTRACT: In the present paper the result obtained by the investigation of Mohr-salt in an acid solution under the influence of  $\gamma$ -radiation of  $\text{Co}^{60}$  ( $3 \cdot 10^{15}$  ev/cm<sup>3</sup>.sec) is investigated. The experimental apparatus is shown by figure 1. Hydrogen pressure was varied between 1 and 180 at. For each hydrogen concentration the initial sections of the oxidation curve were plotted. As shown by figure 2, there is no connection between the course of oxidation and the concentration of hydrogen. This corresponds to the following development of the reaction:



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The Oxidizing Properties of Atomic Hydrogen in the  
Oxidation of Bivalent Ferrous Ions by Radiation

SOV/20-125-6-35/61

3 references, 1 of which is Soviet.

PRESENTED: January 21, 1959, by A. N. Frumkin, Academician

SUBMITTED: January 19, 1959

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DOLIN, P. V.

PHASE I BOOK EXPLOITATION SOV/5628

Akademiya nauk SSSR. Institut biologicheskoy fiziki

Rol' perekisey i kislороda v nachal'nykh stadiyakh radiobiologicheskogo effekta (Role of Peroxides and Oxygen During Primary Stages of Radiobiological Effects) Moscow, 1960. 157 p. 4,500 copies printed.

Responsible Ed.: A. M. Kuzin, Professor; Ed. of Publishing House: K. S. Trincer; Tech. Ed.: P. S. Kashina.

PURPOSE : This collection of articles is intended for scientists in radiobiology and biophysics.

COVERAGE: Reports in the collection deal with the role of peroxides and oxygen in the primary stages of a radiobiological effect. They were presented and discussed at a symposium held December 25-30, 1958, organized by the Institut biofiziki AN SSSR, (Institute of Biophysics, AS USSR). Twenty-eight Moscow scientists, radiobiologists, radiochemists, physicists, and

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Role of Peroxides and Oxygen (Cont.)

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physical chemists took an active part in the symposium. Between the time of its conclusion and the publication of the present book some of the materials were expanded. In addition to the authors the following scientists participated in the discussion: L. A. Tummerman, V. S. Tongur, G. M. Frank, Yu. A. Kriger, E. Ya. Grayevskiy, N. N. Demin, B. N. Tarusov, and I. V. Vereshchenskiy. References follow individual articles.

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Kuzin, A. M. [Institut biologicheskoy fiziki AN SSSR - Institute of Biophysics, AS USSR]. Role of Formation of Peroxides During the Action of Radiation on Biological Specimens	3
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Dolin, P. I. [Institute of Electrochemistry, AS USSR]. Lifetime of Intermediate States Arising During the Action of Radiation on Aqueous Solutions Card 2/5.	20

S/081/61/000/023/008/061  
B108/B147

AUTHOR: Dolin, P. I.

TITLE: Lifetimes of intermediate states occurring in aqueous solutions under the action of irradiation

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 23, 1961, 62 - 63, abstract 23B465 (Sb. "Rol' perekisey i kislороda v nach. stadiyakh radiobiol. effekta". M., AN SSSR, 1960, 20 - 25)

TEXT: This is a survey on experimental work concerned with determination of the lifetime of short-lived products of the radiolysis of aqueous solutions. The paper is intended to give an idea of the biological significance of excited molecules and radicals that form under the action of radiation on aqueous media. [Abstracter's note: Complete translation.] ✓

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S/076/60/034/011/010/024  
B004/B064

AUTHORS: Shubin, V. N. and Dolin, P. I. (Moscow)  
TITLE: Oxidative Properties of Atomic Hydrogen in Radiation  
Oxidation of Bivalent Iron Ions  
PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11,  
pp. 2480-2488

TEXT: This paper gives a report on measurements of the oxidation of bivalent iron under the action of gamma radiation of  $\text{Co}^{60}$  (dose rate, approximately  $3 \cdot 10^{15}$  ev/cm<sup>2</sup>.sec) at a hydrogen pressure of 1-180 atm in the absence and presence of oxygen. Mohr's salt  $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2$ , with a concentration of  $1.3 \cdot 10^{-3}$  M was irradiated in 0.8 N  $\text{H}_2\text{SO}_4$ . The concentration of the  $\text{Fe}^{3+}$  ions forming as a result of irradiation was determined with a spectrophotometer. The values of fresh solutions of Mohr's salt were well reproducible. The  $\text{Fe}^{3+}$  yield is affected neither by the  $\text{Fe}^{3+}$  concentration nor by the concentration and pressure of  $\text{H}_2$ . The following

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Oxidative Properties of Atomic Hydrogen in  
Radiation Oxidation of Bivalent Iron Ions

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reactions are assumed:  $\text{H}_2\text{O} \xrightarrow{\gamma} \text{OH}, \text{H}, \text{H}_2\text{O}_2, \text{H}_2$  (0);  $\text{Fe}^{2+} + \text{OH} \xrightarrow{K_1} \text{Fe}^{3+} + \text{OH}^-$  (1);  $\text{Fe}^{2+} + \text{H}_2\text{O}_2 \xrightarrow{K_2} \text{Fe}^{3+} + \text{OH}^- + \text{OH}$  (2);  $\text{H}_2 + \text{OH} \xrightarrow{K_3} \text{H}_2\text{O} + \text{H}$  (3);  $\text{H} + \text{H}^+ \xrightarrow{K_4} \text{H}_2^+$  (4);  $\text{Fe}^{2+} + \text{H}_2^+ \xrightarrow{K_5} \text{Fe}^{3+} + \text{H}_2$  (5), or  $\text{Fe}^{2+} + \text{H} + \text{H}^+ \xrightarrow{K_4} \text{Fe}^{3+} + \text{H}_2$  (5a). The experimental data show that, irrespective of its origin atomic hydrogen is capable of oxidizing to  $\text{Fe}^{2+}$ . The assumption of a participation of water molecules is not necessary to explain the high yield of oxidation. In the presence of  $\text{O}_2$ , the oxidation proceeds as a chain reaction. Proceeding from the experimental data the following values were calculated:  $K_3/K_1 = 0.135$  which is in good agreement with the values previously obtained;  $K_1 = 1.65 \cdot 10^4$  l/mole.sec.  $K_4 = 2 \cdot 10^4$  l/mole.sec. The constancy of  $K_4$  confirms the accuracy of the reaction scheme suggested. On the basis of the data of F. Dainton and H. Sutton (Ref. 10), a kinetic calculation was made and, thus, indirectly proved that the  $\text{Fe}^{2+}$  oxidation by atomic oxygen takes place according to the reactions (4) and (5), as

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Oxidative Properties of Atomic Hydrogen in  
Radiation Oxidation of Bivalent Iron Ions

S/076/60/034/011/010/024  
B004/B064

was also assumed by J. Weiss (Ref. 1). There are 6 figures, 1 table, and 15 references: 7 Soviet, 2 US, 5 British, and 1 French.

ASSOCIATION: Akademiya nauk SSSR, Institut elektrokhimii (Academy of Sciences of the USSR, Institute of Electrochemistry)

SUBMITTED: February 14, 1959

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S/076/60/034/011/013/024  
B004/B064

AUTHORS: Brusentseva, S. A. and Dolin, P. I. (Moscow)  
TITLE: Radiative Oxidation of  $\text{Fe}^{2+}$  Ions in Solutions Containing KBr  
PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11,  
pp. 2513-2516

TEXT: The authors wanted to determine the ratio between the rate constants of the reaction of  $\text{Fe}^{2+}$  and  $\text{Br}^-$ , and of  $\text{Fe}^{2+}$  and  $\text{Cl}^-$  ions with OH radicals. The  $3 - 4 \cdot 10^{-4}$  M  $\text{FeSO}_4$  solutions were irradiated in 0.8 N  $\text{H}_2\text{SO}_4$  with  $\text{Co}^{60}$  (dose rate,  $(2 + 4) \cdot 10^{15}$  ev/cm<sup>3</sup>.sec) at various concentrations of the added KBr or KCl. In  $\text{FeSO}_4$  solutions saturated with air, the  $G(\text{Fe}^{3+})$  yield decreases from 15.6 to 12.3 if the KBr concentration is  $10^{-1}$  M. A rise of the KBr concentration entails an increase of  $G(\text{Fe}^{3+})$  to 16.5-16.9. In an evacuated  $\text{FeSO}_4$  solution,  $G(\text{Fe}^{3+})$  falls from 8.8 to 4.4 in the presence of 0.1 M KBr and rises again with an increase of the KBr concentration. ✓  
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Radiative Oxidation of  $\text{Fe}^{2+}$  Ions in  
Solutions Containing KBr

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B004/B064

When KCl is added,  $G(\text{Fe}^{3+})$  does not decrease but rises again at high KCl concentrations. This effect of KBr is explained by the compatible reaction rates  $\text{Fe}^{2+} + \text{OH} \rightarrow \text{Fe}^{3+} + \text{OH}^-$  (1) and  $\text{Br}^- + \text{OH} \rightarrow \text{Br} + \text{OH}^-$  (7), as well as  $\text{H} + \text{H}^+ \rightarrow \text{H}_2^+$  (5) and  $\text{Br} + \text{H} \rightarrow \text{Br}^- + \text{H}^+$  (8). At KCl the rate of the reaction  $\text{Cl}^- + \text{OH} \rightarrow \text{Cl} + \text{OH}^-$  is incompatible with the reactions of  $\text{Fe}^{2+}$  and therefore, remains without effect. The  $G(\text{Fe}^{3+})$  increase observed at high KBr and KCl concentrations is explained by the oxidation of  $\text{Fe}^{2+}$  by the liberated halogens. The ratio of the reaction constants of the  $\text{Fe}^{2+}$  and  $\text{Br}^-$  ions with the OH radicals determined from the dependence of the  $\text{Fe}^{2+}$  oxidation on the ratio  $[\text{Fe}^{2+}] : [\text{Br}^-]$  of the concentrations was found to be 90. There are 3 figures and 5 references: 1 Soviet, 2 US, 1 British, and 1 Canadian.

ASSOCIATION: Akademiya nauk SSSR, Institut elektrokhimii (Academy of Sciences of the USSR, Institute of Electrochemistry)

SUBMITTED: February 24, 1959

Card 2/2

5.4500(B)

AUTHORS: Brusentseva, S. A., Dolin, P. I. S/020/60/131/01/032/060  
B004/B011

TITLE: Radiolysis of KBr Solutions Under the Action of 660-Mev Protons

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 1, pp 117 - 119 (USSR)

ABSTRACT: The aim of the present paper is that of investigating the action of a heavy radiation having such a high energy that the value  $-dE/dx$  approaches that of a light radiation, in order to determine those difference as arise with heavy radiation due to central collisions. In the case of the 660-Mev proton radiation used for this investigation, the value of  $-dE/dx$  was almost equal to that of a 1-Mev electron radiation. As this causes the same radiochemical processes as the gamma radiation of  $Co^{60}$ , the latter was taken for a comparison. The energy absorbed by the solution was determined by measuring the total proton flux by two methods: (1) by measuring the  $C^{11}$  activity of a graphite plate that was placed in the proton flux; (2) by the use of an ionization chamber calibrated according to the Faraday cylinder. Measuring results differed by 25 - 30%.

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Radiolysis of KBr Solutions Under the Action of  
660-Mev Protons

S/020/60/131/01/032/060  
B004/B011

Radiolysis was investigated on solutions of  $\text{FeSO}_4$ , KBr, and on pure water.  $G(\text{Fe}^{3+})$  was spectroscopically determined in  $\text{FeSO}_4$  solutions (Fig 1), and the same value was found as in the gamma radiation of  $\text{Co}^{60}$ . In KBr solutions the authors measured the amount of hydrogen that was burned in a vacuum apparatus on platinum wire at 180 - 200°. As is shown by figure 2,  $G(\text{H}_2)$  increases with rising KBr concentration up to  $10^{-3}$  M, remains constant between  $10^{-3}$  and  $10^{-2}$  M, and rises again with higher concentrations. The same result was obtained for gamma radiation of  $\text{Co}^{60}$ . Hence, it follows from experiments made with  $\text{FeSO}_4$  and KBr that the radiochemical effect is solely dependent on a single index of radiation, namely, on the energy loss per unit of distance. The determination of  $G(\text{H}_2)$  in pure water in the case of gamma radiation yielded 0.07 molecules per 100 ev, and 0.15 - 0.19 in the case of proton radiation. The authors, however, do not consider the explanation of this difference by central collisions to be probable, 4

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Radiolysis of KBr Solutions Under the Action of  
660-Mev Protons

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B004/B011

but assume the action of impurities. There are 2 figures and  
7 references, 3 of which are Soviet.

PRESENTED: November 20, 1959 by A. N. Frumkin, Academician

SUBMITTED: November 10, 1959

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S/020/60/132/04/40/064  
B004/B007

5.4500(B)  
5.4600

AUTHORS: Kokoulina, D. V., Dolin, P. I., Frumkin, A. N., Academician

TITLE: The Effect of Radiation Upon the Potential of the Platinum Electrode in a Sulfuric Acid Solution

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 4, pp.880-883

TEXT: V. I. Veselovskiy and Ts. I. Zalkind (Ref. 1) were the first to find that in the irradiation of an  $H_2SO_4$  solution with nitrogen, a potential forms on the Pt electrode, which is close to the potential of the reversible hydrogen electrode. It was the aim of the present paper to explain the conditions under which the H potential and the potential close to 0.85 v form on the Pt electrode in irradiation, and to clarify the part played in this process by molecular and radical products. The experiments were carried out by X-ray irradiation. Two forms of glass cells (Fig. 1) were used. Cell I had a large gas space into which the hydrogen formed was able to escape, whereas in the narrow cell II the escaping of  $H_2$  was

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The Effect of Radiation Upon the Potential of  
the Platinum Electrode in a Sulfuric Acid  
Solution

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B004/B007

rendered difficult. During the experiment the solution could be changed by supplies from a storage vessel in which the solution was saturated with  $H_2$  and  $N_2$ . Several experiments were also made while the solution passed through a glass tube. Fig. 2 shows the dependence of the potential of the Pt electrode ( $P_{Pt}$ ) on the duration of irradiation of different intensities. In solutions saturated with  $N_2$ ,  $P_{Pt}$  at first shifts towards the H potential, after which it assumes a constant value of about 0.85 v, irrespective of the irradiation intensity. The authors draw the conclusion that this  $P_{Pt}$  corresponds to the concentration of molecular  $H_2$  formed by radiolysis, and substantiate this opinion by the following observations: 1) By interruption of the irradiation before the maximum negative potential has been attained,  $P_{Pt}$  at first shifts further towards the value of the H electrode, after which, according to whether cell I or II had been used, it assumes the value 0.85 v more quickly or more slowly. 2) The addition of an active radical acceptor (KBr) changes nothing in the dependence of  $P_{Pt}$  on the radiation dose. 3) During

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The Effect of Radiation Upon the Potential of  
the Platinum Electrode in a Sulfuric Acid  
Solution

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B004/B007

irradiation in a flowing solution, no shifting towards negative values occurs. If, however, the passage is blocked,  $P_{Pt}$  changes in the same manner as in cell II (Fig. 2). 4) In cell II there is an increase to 0.85 v only in the case of a larger dose than in cell I, from which  $H_2$  is able to escape. In full agreement with S. D. Levina and T. V. Kalish the authors arrive at the conclusion that atomic hydrogen plays no essential part in this process. The potential of 0.85 v corresponds to a stable state of the platinum electrode in an irradiated sulfuric acid solution. The shift of  $P_{Pt}$  in the positive direction was caused by the concentration of  $H_2O_2$  in the solution (Fig. 4). The potential of the Pt electrode in 0.8 N  $H_2SO_4$  is due to molecular products ( $H_2$  and  $H_2O_2$ ) forming in the solution during irradiation. Here, the radical products play no noticeable part. They are apparently for the greater part recombined in the solution and on the surface of the electrode. There are 4 figures and 7 references: 4 Soviet and 3 British.

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The Effect of Radiation Upon the Potential of  
the Platinum Electrode in a Sulfuric Acid  
Solution

S/020/60/132/04/40/064  
B004/B007

ASSOCIATION: Institut elektrokhimii Akademii nauk SSSR (Institute of  
Electrochemistry of the Academy of Sciences, USSR)

SUBMITTED: February 26, 1960

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S/020/60/134/004/036/036XX  
B004/B067

21.6100

AUTHORS: Shubin, V. N. and Dolin, P. I.

TITLE: Radiative Reduction of Ions of Trivalent Iron in Solutions  
Saturated With Hydrogen Under Pressure

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 4,  
pp. 891-894

TEXT: The present study is based upon the fact that the investigations of the characteristic values kinetic of  $Fe^{3+}$  have hitherto been made for systems with different admixtures (Refs. 1-4) where disturbing side processes may occur. Therefore, the authors measured the reduction of  $Fe^{3+}$  in acid solution during the action of gamma radiation of  $Co^{60}$  (dose of about  $3 \cdot 10^{15}$   $ev/cm^3 \cdot sec$ ) at different hydrogen pressures (up to 150 atm) and at different concentrations of  $Fe^{3+}$  and of the acid. The concentration of the resulting  $Fe^{2+}$  was determined with o-phenanthroline. The following reaction equations were derived from the experimental results:

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86407

Radiative Reduction of Ions of Trivalent  
Iron in Solutions Saturated With Hydrogen  
Under Pressure

S/020/60/134/004/036/036XX  
B004/B067

$H_2 + OH \xrightarrow{k_1} H_2O$  (1);  $H + OH \xrightarrow{k_2} H_2O$  (2);  $Fe^{3+} + H \xrightarrow{k_3} Fe^{2+} + H^+$  (3), where the reaction (3) is competitive with (2). The following relation is written next:  $k_2/k_1k_3 = [G_H + G_{OH} - G(Fe^{2+})] [H_2] [Fe^{3+}] / [G(Fe^{2+}) + G_{OH} - G_H] G(Fe^{2+}) \cdot M$  (I). The divergence between this reaction equation according to which the reduction is independent of the acid concentration, and the experimental data according to which such a dependence exists, is explained by the

reaction  $Fe^{3+} + HSO_4^- \xrightleftharpoons{K_a} FeHSO_4^{2+}$ . In the presence of  $HClO_4$  no complex ion is formed, and the reaction does not depend on the acid concentration. From  $\alpha k_2/k_1k_3$ , where  $\alpha = [Fe^{3+}_{summ}] / [Fe^{3+}_{free}]$ , the equation  $Fe^{3+}_{free} + K_a [(f_{HSO_4}$

$- f_{Fe^{3+}}) / f_{FeHSO_4^{2+}}] [HSO_4^-] [Fe^{3+}_{free}] = Fe^{3+}_{summ}$  (II), and the ratios  $\alpha_1, \alpha_2, \alpha_3$

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Radiative Reduction of Ions of Trivalent  
Iron in Solutions Saturated With Hydrogen  
Under Pressure

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B004/B067

for pH = 0.4, 0.8, and 1.4,  $K_a$  was found to be 91 l/mole. Herefrom and from the value for  $k_1$  obtained by L. I. Avraamenko and R. V. Lorentso (Ref. 7) ( $2.5 \cdot 10^3$  l/mole.sec)  $k_2$  was found to be  $1.4 \cdot 10^{11}$  l/mole.sec,  $k_3 = (8 \pm 0.56) \cdot 10^5$  l/mole.sec. There are 3 figures and 7 references: 2 Soviet, 1 US, 2 British, and 1 Czechoslovakian.

ASSOCIATION: Institut elektrokhemii Akademii nauk SSSR (Institute of Electrochemistry of the Academy of Sciences USSR)

PRESENTED: May 20, 1960, by A. N. Frumkin, Academician

SUBMITTED: May 20, 1960

Card 3/3

KNUNYANTS, I.L., glav. red.; BAKHAROVSKIY, G.Ya., zam. glav. red.;  
 BUSEV, A.I., red.; VARSHAVSKIY, Ya.M., red.; GEL'PERIN,  
 N.I., red.; DOLIN, P.I., red.; KIREYEV, V.A., red.; MEYERSON,  
 G.A., red.; MURIN, A.N., red.; POGODIN, S.A., red.; REBINDER,  
 P.A., red.; SLONIMSKIY, G.S., red.; STEPANENKO, B.N., red.;  
 EPSHTEYN, D.A., red.; VASKEVICH, D.N., nauchnyy red.; GALLE,  
 R.R., nauchnyy red.; GARKOVENKO, R.V., nauchnyy red.; GODIN,  
 Z.I., nauchnyy red.; MOSTOVENKO, N.P., nauchnyy red.;  
 LEBEDEVA, V.A., mladshiy red.; TRUKHANOVA, M.Ye., mladshiy  
 red.; FILIPPOVA, K.V., mladshiy red.; ZHAROVA, Ye.I., red.;  
 KULIDZHANOVA, I.D., tekhn. red.

[Concise chemical encyclopedia] Kratkaia khimicheskaya entsiklo-  
 pediia. Red. koll.: I.L.Knuniants i dr. Moskva, Gos. nauchn.  
 izd-vo "Sovetskaya entsiklopediia." Vol.1. A - E. 1961.  
 1262 columns. (MIRA 15:2)

(Chemistry—Dictionaries)

S/030/61/000/001/016/017  
B105/B206

AUTHORS: Vereshchinskiy, I. V., Candidate of Chemical Sciences,  
Dolin, P. I., Doctor of Chemical Sciences

TITLE: Trends of radiation-chemistry development

PERIODICAL: Vestnik Akademii nauk SSSR, no. 1, 1961, 116-119

TEXT: The Second All-Union Conference on Radiation Chemistry was held in Moscow from October 10 to 14, 1960. It was convened by the Otdeleniye khimicheskikh nauk Akademii nauk SSSR (Department of Chemical Sciences of the Academy of Sciences USSR) as well as the Gosudarstvennyy komitet Soveta Ministrov SSSR po khimii (State Committee for Chemistry of the Council of Ministers of the USSR). The Conference dealt with the discussion of theoretical problems of radiation chemistry of aqueous solutions, organic substances, high-molecular compounds, and solid substances. Phenomena taking place in the systems mentioned under the effect of ionizing radiation play an important role in nuclear engineering and radiobiology. The present state of the problem of primary processes and the mechanism of radiation-chemical reactions was checked

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Trends of radiation-chemistry ...

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specially. For the first time it was endeavored to outline the statistical theory of activation processes in condensed bodies, which proceed in the field of ionizing radiation, as well as to utilize the theory of the repeated dispersion of electrons in the substance for studying the mechanism of radiolysis. Problems of energy migration in condensed systems were discussed. In accordance with the radical-diffusion theory of the water radiolysis, the OH radicals and H atoms developing in places of high ionization density are to be considered as being primary products of the water radiolysis. A still simpler model of radiolysis was proposed for the field of dilute solutions. The data mentioned at the Conference, which refer to the radiolysis of the solutions of  $\text{H}_2\text{O}_2$ ,  $\text{O}_2$ ,  $\text{H}_2$ ,  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{NO}_3^-$ ,  $\text{ClO}_3^-$ ,  $\text{SO}_4^{2-}$ , the neptunium salts and uranium salts, agree well with the model mentioned. Concepts on the role of excited water molecules in the process of radiolysis were taken into consideration in a number of reports, specially those concerning the aqueous solutions of organic compounds, in order to clarify experimental results. Problems of radiation-electrochemical processes in aqueous solutions were discussed in detail. The studies of reactions of the

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Trends of radiation-chemistry ...

S/030/61/000/001/016/017  
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radiation-chemical synthesis may be described as being a promising trend of radiation chemistry. The initiating of chain reactions through the effect of ionizing radiation constitutes an independent problem. The conduction of radiolytic oxidation at various temperatures permits demarcation of the area of the non-chain- radical-reaction course and the area of a chain process. The studies of the sensitizer effect of the solid phase on the radiolysis process are given special mention. Radiation polymerization and the effect of radiation on polymers for the purpose of their modification represent the main problems of the radiation chemistry of polymeric materials. Studies were conducted regarding the effect of different parameters on the radiation polymerization of low-molecular monolefins, acetylene hydrocarbons, trifluoro ethylene, tetrafluoro ethylene, allyl silane, phosphonitryl chloride. The stabilizing effect of the organozinc compounds on the heat resistance of the irradiated polyethylene was shown next. The majority of the studies for the investigation of unstable intermediate products of radiolysis was done either with frozen hydrocarbons or with polymers, the measurements of the spectra of the electron-paramagnetic resonance proving to be most useful. New types of electron accelerators specially

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Trends of radiation-chemistry ...

S/030/61/000/001/016/017  
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built for purposes of radiation-chemistry and distinguished by very high voltages at relatively low current energies are described as being very promising. Finally, it is stated that the volume of research in all fields of radiation chemistry has greatly increased during the last 3.1/2 years since the previous conference. New fields of scientific studies (such as the chemical effect of radiation on solids and heterogeneous systems) were created. The number of scientific institutions occupied with research in the field of radiation chemistry has greatly increased, also outside the scientific centers. Characteristic for this period of time is the further use of physical investigation methods, primarily the e.p.r. which permits to gain insight into the nature of short-lived intermediate products, developing under radiation effect. The delegates to the Conference unanimously approved the proposal by the Orgkomitet (Organizing Committee) to convene a conference which would deal with individual theoretical problems of radiation chemistry. ✓

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SHUBIN, V.N.; DOLIN, P.I.

Radiation-induced transformations in a mixture of  $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$   
in acid solutions saturated with hydrogen under pressure. Dokl.  
AN SSSR 138 no.1:169-172 My-Je '61. (MIRA 14:4)

1. Institut elektrokhemii AN SSSR. Predstavleno akademikom  
A.N. Frumkinym.  
(Radiation) (Oxidation-reduction reaction)

SHUBIN, V.N.; DOLIN, P.I.

Effect of acidity on the yield of chemical radiation reactions.  
Dokl. AN SSSR 139 no.1:154-157 51 '61. (MIRA 14:7)

1. Institut elektrokhemii AN SSSR. Predstavleno akademikom A.N.  
Frumkinym.

(Hydrogen--Ion concentration) (Radiochemistry)

29826  
S/020/61/140/006/027/030  
B107/B101

5.4600 (also 1273, 1304)  
AUTHORS: Shubin, V. N., and Dolin, P. I.

TITLE: Radiation-induced transformations of iron ions in perchlorate solutions saturated under pressure with hydrogen and oxygen

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 6, 1961, 1380-1383

TEXT: In previous publications, the authors described radiochemical transformations in a system containing  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{H}_2$ , and  $\text{H}^+$  (V. N. Shubin, P. I. Dolin, DAN, 138, No. 1 (1961); V. N. Shubin, P. I. Dolin, DAN, 139, No. 1 (1961)). The present paper treats the effect of  $\text{Co}^{60}$  gamma radiation on aqueous solutions of  $\text{Fe}(\text{ClO}_4)_3$  and  $\text{Fe}(\text{ClO}_4)_2$  saturated under pressure with  $\text{H}_2$  and  $\text{O}_2$ . The concentrations of these substances and the hydrogen ion concentration were varied. The experimental procedure has been described previously (Ref. 8: V. N. Shubin, P. I. Dolin, ZhFKh, 43, 2480 (1960)). The dose rate was  $1.75 \cdot 10^{15}$  ev/cm<sup>3</sup>.sec. The following radiochemical oxidation mechanism for  $\text{Fe}^{2+}$  solutions in the presence of  $\text{O}_2$  ✓  
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Radiation-induced transformations...

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has been proposed: (Ref. 3, see below):  $H + O_2 \rightarrow HO_2$  (1);  
 $HO_2 + Fe^{2+} \rightarrow Fe^{3+} + HO_2^-$  (2);  $HO_2^- + H^+ \rightarrow H_2O_2$  (3);  
 $H_2O_2 + Fe^{2+} \rightarrow Fe^{3+} + OH^- + OH$  (4);  $OH + Fe^{2+} \rightarrow Fe^{3+} + OH^-$  (5). In the  
presence of  $Fe^{3+}$ , additional reactions are assumed to take place (Ref. 4,  
see below):  $H + Fe^{3+} \rightarrow Fe^{2+} + H^+$  (6);  $HO_2 \rightleftharpoons H^+ + O_2^-$  (7);  $O_2^- + Fe^{3+} \rightarrow Fe^{2+} + O_2$   
(8). Systems of this type have been investigated by Allen and Rotschild  
(Ref. 5 and Ref. 6, see below). On the other hand, it has been supposed  
that reactions (2) and (3) could be replaced by  $2 HO_2 \rightarrow H_2O_2 + O_2$  (9)  
(V. D. Orekhov, A. I. Chernova, M. A. Proskurnin, Sborn. rabot po  
radiatsionnoy khimii (Collection of studies in radiation chemistry). Izd.  
AN SSSR, 1955, p. 85). If, in addition,  $H_2$  is present in the system, a  
chain reaction may occur (Ref. 8) involving reactions (1) - (4), or (1), (9),  
and (4) as well as the reaction  $OH + H_2 \rightarrow H_2O + H$  (10). Chain rupture  
occurs by reactions (5) - (8). The experimental results of the present  
work show that the oxidation yield is strongly dependent on the  $[Fe^{2+}]$   
(Fig. 1). Radiolysis therefore proceeds via reactions (2) and (3), and  
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Radiation-induced transformations...

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not by reaction (9). Assuming the yield of the radiolysis to be given by reactions (1) - (8), and (10), the relation between the radiation yields and the rates of the competitive reactions may be expressed by

$$\begin{aligned} & \left(1 + \frac{k_8 [\text{Fe}^{2+}]}{k_1 [\text{O}_2]}\right) \left(1 + \frac{k_8 K_{\text{HO}_2} [\text{Fe}^{2+}]}{[\text{Fe}^{2+}] [\text{H}_2]}\right) = \\ & = \frac{[G(\text{Fe}^{2+}) - G_{\text{H}} - G_{\text{OH}} - 2G_{\text{H}_2\text{O}_2}] / (1 + k_8 [\text{Fe}^{2+}] / k_1 [\text{H}_2])}{G(\text{Fe}^{2+}) - G_{\text{H}} - G_{\text{HO}} - 2G_{\text{H}_2\text{O}_2} + 2[G_{\text{H}} + (G_{\text{OH}} + G_{\text{H}_2\text{O}_2}) / (1 + k_8 [\text{Fe}^{2+}] / k_1 [\text{H}_2])]} + (I) \\ & + \frac{4[G_{\text{H}} + (G_{\text{OH}} + G_{\text{H}_2\text{O}_2}) / (1 + k_8 [\text{Fe}^{2+}] / k_1 [\text{H}_2])]}{G(\text{Fe}^{2+}) - G_{\text{H}} - G_{\text{OH}} - 2G_{\text{H}_2\text{O}_2} + 2[G_{\text{H}} + (G_{\text{OH}} + G_{\text{H}_2\text{O}_2}) / (1 + k_8 [\text{Fe}^{2+}] / k_1 [\text{H}_2])]} = F(G). \end{aligned}$$

From the graphic solution of Eq. (I) using the values given in Table 1 results:  $k_6/k_1 = 2.45 \cdot 10^{-2}$ , and  $(k_8/k_2)K_{\text{H}_2\text{O}} \approx 3.1 \cdot 10^{-3}$  mole/liter. A

further series of measurements showed that the reaction  $\text{Fe}^{2+} + \text{H} = \text{FeH}^{2+} + \text{H}^+ \rightarrow \text{Fe}^{3+} + \text{H}_2$  may be neglected, i. e. that  $\text{Fe}^{2+}$  does not compete with  $\text{O}_2$  for H atoms. In order to verify reactions (2), (7), and (8), the  $\text{Fe}^{3+}$

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Radiation-induced transformations...

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yield was studied as a function of  $[H^+]$ ,  $[Fe^{2+}]$ , and  $[Fe^{3+}]/[O_2]$   
= const. (Table 3). The graphic solution of Eq. (I) yielded  
 $k_8 K_{H_2O}/k_2 = 3.6 \cdot 10^{-3}$  mole/liter. This is in good agreement with the  
values calculated from the data published by Allen and Rotschild. The  
results show that oxygen is a highly active acceptor of H atoms. It was  
therefore attempted to determine the influence of excited water molecules  
on the radiolysis of  $Fe^{2+}$  and  $Fe^{3+}$  by varying the oxygen concentration.  
In this case Eq. (I) transforms the inequality

$$\left(1 + \frac{k_4 [Fe^{3+}]}{k_1 [O_2]}\right) \left(1 + \frac{k_8 K_{H_2O} [Fe^{3+}]}{k_2 [Fe^{2+}] [H^+]}\right) > F(G). \quad (II)$$

Fig. 4 shows the oxidation yield as a function of  $p_{O_2}$  up to  $[O_2] \approx 0.1$  M

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Radiation-induced transformations...

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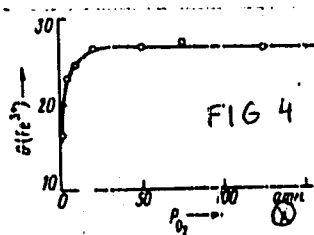
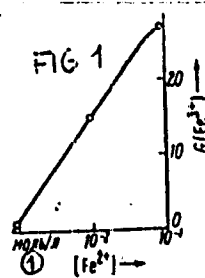
(150 atm). Calculation shows that the horizontal section of the curve fulfills the condition (I). Thus, if  $[O_2] < 0.1$  M, the excited water molecule exerts no influence on the oxidation reaction of  $Fe^{2+}$ . Taken summarily, the results of this study show that the radiolysis of solutions containing  $Fe^{2+}$  and  $Fe^{3+}$  in the presence of  $O_2$  and  $H_2$  is quantitatively described by reactions (1) - (8), and (10). There are 4 figures, 3 tables, and 8 references: 4 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: Ref 3: F. H. Kreuz, H. A. Dewhurst, J. Chem. Phys., 17, 1337, (1949); Ref 4: W. G. Barb, J. H. Fakeudale, P. George, K. R. Hargrave, Trans. Farad. Soc., 47, 591 (1951); Ref 5: A. O. Allen, W. G. Rotschild, Radiation Res., 7, 591 (1957); Ref 6: A. O. Allen, V. D. Hogau, W. G. Rotschild, Radiation Res., 7, 603 (1957).

ASSOCIATION: Institut elektrokhemii Akademii nauk SSSR (Institute of Electrochemistry of the Academy of Sciences USSR)

PRESENTED: April 18, 1961, by A. N. Frankin, Academician  
Card 5/8

Radiation-induced transformations...

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Radiation-induced transformations...

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B107/E101

Fig. 1: Oxidation yield as a function of  $[Fe^{2+}]$ .  $[Fe^{3+}] \sim 10^{-3}$  M;  $HClO$   
 $[HClO_4] \sim 10^{-2}$  M;  $p_{O_2} = 10.2$  atm;  $[Fe^{2+}]/[H_2] \sim \text{const.}$  Legend: (1) mole/liter.

Fig. 4. Oxidation yield as a function of  $p_{O_2}$  on the solution.  
 $[HClO_4] \sim 0.1$  M;  $[Fe^{3+}] \sim 8 \cdot 10^{-3}$  M;  $[Fe^{2+}] \sim 2 \cdot 10^{-3}$  M;  $p_{H_2} = 50$  atm.

Legend: (x) atm.

Table 1.  $G(Fe^{3+})$  as a function of  $[O_2]$  and  $[Fe^{3+}]$ .  $p_{H_2} = 50$  atm;

$[Fe^{3+}]/[Fe^{2+}] \approx 13$

Acceptor	$O_2$					$Fe^{3+}$					
Concentration, mM	0.28	0.98	1.68	4.48	14.3	190	100	39	20	11	9.2
$G(Fe^{3+})$ , mole/100 ev	3.4	11.9	13.5	18.5	21.5	5	6.7	12.2	-	13.5	-

$H^+ \sim 0.12$  M

$H^+ \sim 5 \cdot 10^{-3}$  M      -      -      6.5      7      -      -      -      6.7      -      6.6

Radiation-induced transformations...

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Table 3. Yield as a function of  $[Fe^{3+}]$ ,  $[Fe^{2+}]$ , and  $[H^+]$ .  $[Fe^{3+}]/[O_2] \approx \text{const}$

Acceptor	$Fe^{3+}$			$Fe^{2+}$			$H^+$		
Concentration, mM	63	8.4	0.15	0.14	0.81	8.3	5.1	45	450
G( $Fe^{3+}$ ), mole/100 ev	3.7	25	43.5	-1	17.5	19.5	7.5	17	22

YEGUNOV, A.V.; DOLIN, P.I.

Radiochemistry of aqueous solutions of cobalt (III) and nickel  
(II) ammoniates. Dokl. AN SSSR 142 no.1:117-119 Ja '61.  
(MIRA 14:12)

1. Institut elektrokhimii Akademii nauk SSSR. Predstavleno  
akademikom A.N. Frankimym.

(Cobalt compounds) (Nickel compounds)  
(Radiochemistry)

*DOLIN, P. I.*

(d)  
The Role Played in Electrode Processes by Stable Products Formed when Aqueous Solutions Are Exposed to Radiation

P. I. Dolin, D. V. Kiseleva and S. A. Bravtseva

The participation of the short-lived products of water radiolysis in the establishment of the electrode potential and in the electrode process has been discussed in the literature. The experimental results obtained by the authors with a Pt electrode in a solution of sulphuric acid find a complete interpretation in those electrode reactions in which only the molecular products of water radiolysis ( $H_2$  and  $H_2O_2$ ) take part.

An investigation of the effect of radiation on the rate of electrochemical oxidation of formic acid and ethyl alcohol on a rotating Pt electrode showed that the observed effects are also determined by general by stable products formed when radiation acts on these solutions. The fundamental part in the formic acid solution is played by hydrogen peroxide, and in the ethanol solution by acetaldehyde and hydrogen peroxide. The participation of short-lived radiolysis products has not been detected in these processes.

*Radiation Chemical Laboratory, Electrochemical Institute, Academy of Sciences, Moscow, USSR*

report presented at the 2nd Intl. Congress of Radiation Research,  
Harrogate/Yorkshire, Gt. Brit., 5-11 Aug 1962

DOLIN, P. I.

Radiation Oxidation of Iron and Chromium Ions in Aqueous Solutions

V. N. Shubin and P. I. Dolin

When  $H_2$  is introduced into the solution, the hydroxyl radical which is formed during the radiolysis of water is partly or completely converted to a hydrogen atom. Complete transformation which can occur with hydrogen under pressure, makes it possible to study reactions between atomic hydrogen and various acceptors without the complicating influence of OH radicals.

If the mechanism of radiolysis involves two reactions which are difficult to separate, it is useful to introduce a third radical acceptor which, as special experiments have proved, reacts with atomic hydrogen. To explain the mechanism in the system thus obtained, it is sufficient to determine the dependence of the radiolysis yield on the

Radiation Cleavage of Water

Monday Afternoon Session A-5-1 (Cont'd)

concentration of all three acceptors. The variation of the yield as a function of concentration of the competing acceptors will be identical, whereas any variation of concentration of the inactive substance will not influence the yield. The qualitative conclusions are borne out by the results of the quantitative analyses used in the investigation of radiolysis of iron and chromium ions.

Department of Chemical Sciences, State Scientific Institute, U.S.S.R. Academy of Sciences, Moscow

SESSION A-6-1: Biochemical Response of Brain and Nerves

(a)  
Studies on the Radiopharmacology of the Central Nervous System

S. J. Arbus

The distribution of  $^{35}S$ -labeled  $\beta$ -mercapto-ethylamine in the nervous system has been investigated. Three hr after administration, the concentration in the cerebral cortex was found to be higher than that in other tissues. At 6 hr, the amount in the sub-cortical tissues had increased, while, at 24 hr, the drug was concentrated in the brain stem. This drug was found to depress the process of excitation in the cerebral cortex. The sulphur-containing radioprotectors were found to have a sedative action.

Imidazole 2-carboxylic acid compounds, owing to their sedative action, prevent both excitation and inhibition in the central nervous system, and so protect against radiation injury. Aminosalicylic acid and phenatin have been found to reduce the extent of impairment, and shorten the time required for recovery of a number of unconditioned responses.

It is suggested that drugs which affect the passage of the nerve impulse should be investigated.

3/844/62/000/000/013/129  
D290/D307

AUTHORS: Dolin, P. I. and Arshler, B. V.

TITLE: Recent results concerning the mechanisms of radiation-chemical changes in aqueous solutions

SOURCE: Trudy 11 Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 87-101

TEXT: The authors review many recent results on the irradiation of aqueous solutions. They consider at length new evidence supporting the theory that H and OH radicals are the main agents of chemical change in aqueous solutions and discuss briefly the possibility that primary products of irradiation (e.g.  $H_2O^+$  ions and electrons) participate directly in chemical reactions. It is concluded that physical methods must be used to study directly the primary processes following irradiation but that chemical methods can be of some value if used in conjunction with suitable models or irradiation

Card 1, 2



Recent results concerning ...

S/844/62/000/000/015/129  
D290/0507

of solutions (e.g. the radical-diffusion or approximate model discussed in this review). There are 9 figures and 2 tables.

ASSOCIATIONS: Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR (Institute of Theoretical and Experimental Physics, AS USSR); Institut elektrokimii AN SSSR (Institute of Electrochemistry, AS USSR)

Card 2/2

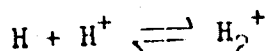
3/844/62/000/000/019/129  
D290/D307

AUTHORS: Shubin, V. N., Dolin, P. I. and Krylova, Z. L.

TITLE: Radiolysis of aqueous solutions of various inorganic substances saturated with hydrogen under pressure

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 129-136

TEXT: The radiolysis of aqueous solutions of inorganic substances was studied by using hydrogen under pressure, by a method described earlier (DAN SSSR, 125, 1294 (1959)). Solutions containing  $\text{Fe}^{3+}$  ions, a mixture of  $\text{Fe}^{3+}$  and  $\text{Fe}^{2+}$  ions, and  $\text{NO}_3^-$  ions were investigated. The experimentally observed yields of oxidation of  $\text{Fe}^{2+}$  and reduction of  $\text{Fe}^{3+}$  can be explained by the occurrence of the reaction:



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Radiolysis of aqueous . . . .

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The yields of reduction of  $\text{NO}_3^-$  ions in neutral solutions at pressures of hydrogen above 100 atmospheres were about 6 equiv/100 ev and did not depend on the  $\text{NO}_3^-$  ion concentration in the range  $3 \times 10^{-3}$  to 1 M. Results obtained with solutions of both  $\text{Fe}^{3+}$  and  $\text{NO}_3^-$  ions show that the yield of decomposition of water was about 4.25 equiv/100 ev and was constant over the pH range ~1 to 7. There are 9 figures and 3 tables.

ASSOCIATION: Institut elektrokhimii AN SSSR (Institute of Electrochemistry, AS USSR)

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S/844/62/000/000/029/129  
D244/D307

AUTHORS: Kokovlina, D. V., Dolin, P. I. and Frumkin, A. N.

TITLE: The influence of irradiation on the Pt electrode potential in sulfuric acid solutions

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 176-182

TEXT: The conditions under which a smooth Pt electrode in 0.8 N  $H_2SO_4$  assumes the hydrogen potential and a potential near to 0.85 v are described. The role played by radical and molecular radiolysis products on the establishment of a given potential after irradiation was also investigated. The irradiation was conducted by x rays, the solutions being placed in glass cells of three different designs. The maximum radiation doses applied were about  $3 \times 10^{17}$  (cell I) and  $7 \times 10^{16}$   $ev/cm^3 \cdot sec$  (cells II and III). The Pt electrode potential in the solution saturated with  $N_2$  decreases ini-

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The influence of ...

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tially and reaches values near to that of the reversible hydrogen potential. This potential is not stable and increases with further irradiation to a value close to 0.85 v. The hydrogen potential is reached when the energy absorbed is  $3 - 5 \times 10^{18}$  ev/cm<sup>3</sup>, irrespective of the total dose. It is concluded that the changes in the Pt electrode potential are determined by the accumulation of molecular radiolysis products (H<sub>2</sub> and H<sub>2</sub>O<sub>2</sub>) in the solution. The radical products are not important for the establishment of the Pt potential, most of them apparently recombining in the solution and on the electrode surface. There are 8 figures.

ASSOCIATION: Institut elektrokhemii AN SSSR (Institute of Electrochemistry, AS USSR)

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S/O2C/63/148/001/029/032  
B107/B186

AUTHORS: Yegunov, A. V., Dolin, P. I.

TITLE: Radiochemical oxidation of potassium ferrocyanide in aqueous solutions

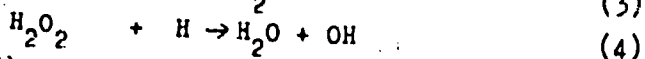
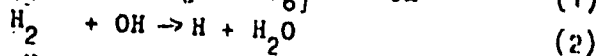
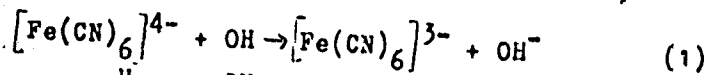
PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 1, 140 - 143, 1962

TEXT: The kinetics of the oxidation of ferrocyanide in 0.2 N sulfuric acid was investigated. The ferricyanide concentration was measured spectrophotometrically. First, the oxidation was measured with  $5.8 \cdot 10^{-4}$  M  $\text{H}_2\text{O}_2$ . It proceeds as a reaction of first order

$$\frac{d[\text{Fe}(\text{CN})_6]^{4-}}{dt} = 1/2 K_0 [\text{H}_2\text{O}_2]_{\tau} [\text{H}_2\text{O}_2]_{\tau}$$
 is the concentration at the moment  $\tau$ , and  $K_0$  is the rate constant. This was determined as being  $(2.4 \pm 0.4) \cdot 10^5 \text{ sec}^{-1}$ . A  $\text{Co}^{60}$  preparation ( $3.66 \cdot 10^{15}$  ev/ml.sec) was used for the radiochemical experiments. The oxidation reaction proceeds first at a linear rate but then passes over to the stationary state. The initial yield of ferricyanide is given by the following reactions:  
Card 1/3

Radiochemical oxidation ...

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B107/B186



As the concentration of  $\text{H}_2\text{O}_2$  and of the radicals  $\text{H}$  and  $\text{OH}$  must be stationary it follows that

$$1 + \frac{2K_2[\text{H}_2]}{K_1[\text{Fe}(\text{CN})_6]^{4-}} = \frac{2G_{\text{H}_2}}{G([\text{Fe}(\text{CN})_6]^{3-})} = \psi(G)$$

The graphic solution produces  $2K_2/K_1 = 18$  and for  $K_1 = (2.8 \pm 0.2) \cdot 10^2 \text{ l/mol-sec}$ .

Conclusions for the oxidation mechanism of the ferrocyanide ion: The different oxidation rate for  $\text{Fe}^{2+}$  and  $[\text{Fe}(\text{CN})_6]^{4-}$  on oxidation by  $\text{H}_2\text{O}_2$  is explained by the type of complex ion. For radiochemical oxidation by the  $\text{OH}$  radical the difference is smaller. The after-effect in the presence of atmospheric oxygen develops through radiochemically formed  $\text{H}_2\text{O}_2$ . Though

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Radiochemical oxidation ...

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the mechanism of the charge transfer from the OH radical to the ferrocyanide ion cannot yet be explained, the authors assume from the high value of  $K_1$  that the radical need not penetrate to the inner coordination sphere, but that the charge can also be transferred over the CN bonds. There are 4 figures and 1 table. The most important English-language references are: A. O. Allen, W. G. Rothschild, Radiation Res., 7, 591 (1957); A.O. Allen, et al. ibid. 603 (1957);

ASSOCIATION: Institut elektrokhemii Akademii nauk SSSR (Institute of Electrochemistry of the Academy of Sciences USSR)

PRESENTED: September 6, 1962, by A. N. Frumkin, Academician

SUBMITTED: September 5, 1962

Card 3/3



BRUSENTSEVA, S.A.; KOKOULINA, D.V.; DOLIN, P.I.

Effect of X rays on the electrochemical oxidation of ethyl alcohol  
on a Pt-anode. Dokl. AN SSSR 147 no.3:649-652 N '62. (MIRA 15:12)

1. Institut elektrokhemii AN SSSR. Predstavleno akademikom A.N.  
Frumkinym.

(Ethyl alcohol) (Electrochemistry) (X rays)

YEGUNOV, A.V.; DOLIN, P.I.

Radiation-induced chemical oxidation of potassium ferrocyanide  
in aqueous solutions. Dokl. AN SSSR 148 no.1:140-143 Ja '63.  
(MIRA 16:2)

1. Institut elektrokhemii AN SSSR. Predstavleno akademikom A.N.  
Frumkinym.

(Potassium ferrocyanide) (Oxidation) (Radiation)

YEGUNOV, A.V.; DOLIN, P.I.

Radiation-chemical reduction of potassium ferricyanide in aqueous solutions of  $H_2SO_4$ . Dokl. AN SSSR 154 no.5:1153-1156 1964.

(MIRA 17:2)

1. Institut elektrokhemii AN SSSR. Predstavleno akademikom A.N. Frumkinym.

BUBYREVA, N.S.; DOLIN, F.I.; KONONOVICH, A.A.; ROZENBLYUM, N.D.

Radiolysis of water vapor in the presence of oxide semiconductors  
ZnO and V<sub>2</sub>O<sub>5</sub>. *Kin. i kat.* 6 no.5:936-938 S.O 165.  
(MIRA 18:11)

BOGRACHEV, A.M.; DOLIN, P.I.; KOKOULINA, D.V.

Effect of preliminary proton irradiation on the function of a  
porous nickel electrode. Zhur. fiz. khim. 39 no.2:497-498 F  
'65. (MIRA 18:4)

1. Institut elektrokhemii AN SSSR.

BRUSENTSEVA, S.A.; IOBREV, D.D.; SHUEIN, V.N.; DOLIN, P.I.

Radiation-chemical oxidation of potassium iodide in solutions saturated with nitrous oxide. Dokl. AN SSSR 162 no.5:1083-1085 Je '65.(MIRA 18:7)

1. Institut elektrokhimii AN SSSR. Submitted December 26, 1964.

I 62998-63 EHG(j)/EWP(e)/EFA(n)-2/HWT(m)/EPF(c)/EWP(1)/EWP(j)/EWP(b)/  
EWA(h)/EWA(1) WH/JT/RW/WI  
ACCESSION NR: AP5015696 UR/0071/65/039/006/1533/1539

AUTHOR: Semenov, N. N. Franklin, A. N. Dolin, P.I.

TITLE: Natal'ya Aleksseyevna Bakh

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 6, 1965, 1533-1539

TOPIC TAGS: physical chemistry, chemical personnel

ABSTRACT: Natal'ya Aleksseyevna Bakh, the well-known physical chemist, was 70 years old on 1 May 1965. Miss Bakh is the daughter of A. N. Bakh, who founded the theory of oxidizing processes. She was born and educated in Switzerland. In 1920, she graduated from the University of Geneva (Department of Physical Mathematics) and went to the Soviet Union, where she started work as one of the first workers of the Physicochemical Institute Im. L. Ya. Karpov (then the Central Chemical Laboratory of VSNKh). Her first work in the A. N. Bakh Laboratory was devoted to studying the effect of ferments and the toxic effect of catalysts. At the same time she was working on a method for obtaining dithionites and their derivatives.

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L 62998-65

ACCESSION No: AP5015696

In 1927, Miss Bakht began investigating electrokinetic processes in the Surface Phenomena Section of the Physicochemical Institute. The connection between colloidal and electrochemical aspects of a number of systems was determined in these investigations. Positively and negatively charged platinum hydrosols were obtained for the first time. The result of this work was the subject of her doctoral dissertation. Parallel with this, she studied the activation mechanism of carbon and the high temperature oxidation of graphite. In 1938, she began studying the reaction mechanism of graphite and carbon black in a Leclanché cell. This helped industry considerably in changing from imported to domestic carbon black.

In 1941, Miss Bakht began working within the system of the Academy of Sciences USSR, that is, in the Colloidal-Electrochemical Institute, the Institute of Physical Chemistry, and the Institute of Electrochemistry. During

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L 62998-65

ACCESSION NR: AP5015698

the war she headed work on defense projects for which she was awarded the Order of the "Red Star". After the war she headed research in a new direction. Under her leadership the first systematic work in the USSR was started on the chemical reaction of ionizing radiation. This was the start of the emergence of radiation chemistry in the USSR. The research of N. A. Bakh and her coworkers contributed greatly to the development of this science. Initial efforts concerned the radiolysis of aqueous solutions and organic compounds. These investigations were developed further into separate divisions: radiation chemistry of water and aqueous solutions, radiative oxidation, and radiolysis of organic compounds.

Investigations of aqueous solutions, conducted on sample solutions of oxygen-containing anions, led to elucidation of patterns of radiative conversions and shed light on the mechanism for the formation of molecular products from the radiolysis of water.

Card 3/6

1. 62998-65

ACCESSION NR: A15015696

Miss Bakh's work on radiative oxidation and radiolysis of organic compounds has made it possible to determine the basic patterns of these processes. The nature of the radiative effect was elucidated in various temperature ranges during oxidation of a wide range of compounds. It was determined that early stages of radiative oxidation led to the formation of an unstable complex of oxygen with radicals which decomposes on the removal of oxygen, and to stable oxidation products in the presence of oxygen. Determination of both of these patterns is opening the way for radiative control of oxidation processes.

Basic investigations making possible industrial recommendations were conducted on the radiolysis and radiative oxidation of solvents and extracting agents. Work on industrial radiation modification of polymers conducted under the leadership of Miss Elakhi for the past several years has led to the creation of materials which possess valuable semiconductor properties.

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I 62998-65

ACCESSION NR: AP5015696

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Miss Bakh was the first to organize training of specialists on radiation chemistry in the USSR. Since 1950, she has been a full professor of radiation chemistry at Moscow State University. Two doctoral and 17 candidate dissertations were prepared and defended under her guidance.

She plays an important role in organizing scientific investigations on radiation chemistry. For many years she performed work for the Commission for the Use of Isotopes and Radiation in Science and the National Economy. She was the organizer of the First and Second All-Union Conferences on Radiation Chemistry and presently is heading the section on radiation chemistry of the Scientific Council on the Chemistry of High Energy Particles, Academy of Sciences, USSR. Miss Bakh has often represented Soviet science at foreign conventions and conferences. For her great service she has been awarded three orders and a medal of the Soviet Union. She is presently continuing further creative work.

Card 5/6

L 62998-65

ACCESSION NR: AP5C15696

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: GC

NR REF SOV: 000

OTHER: 000

FSB w. 1, no. 9

*Lab*  
Card 5/6

SHUBIN, V.N.; DOLIN, P.I.

Yield of products from water radiolysis in acid solutions  
saturated with argon under high pressure. Dokl. AN SSSR  
164 no.2:382-383 S '65. (MIRA 18:9)

1. Institut elektrokhimii AN SSSR. Submitted February 23,  
1965.

KABAKCHI, S.A.; SHUBIN, V.N.; DOLIN, P.I.

Stationary states in the radiolysis of neutral aqueous solutions  
of oxygen. Dokl. AN SSSR 165 no.3:601-603 N '65.

(MIRA 18:11)

1. Institut elektrokhimii AN SSSR. Submitted April 23, 1965.

DOLIN, R.I.; ERSHLER, B.V.

[Radiolysis of water in the presence of  $H_2$  and  $O_2$  caused by reactor radiation, fission fragments, and X rays] Radioliz vody v prisutstvi  $H_2$  i  $O_2$  pod deistviem izlucheniia reaktora, oskolkov deleniia i rentgenovskogo izlucheniia. Moskva, 1955. 30 p. (MIRA 14:6)

(Water)

(Radiation)

(Nuclear reactors)

DOLIN, V.G.

Larvae of click beetles of the genus *Melanotus* Esch. (Coleoptera, Elateridae) in the European part of the U.S.S.R. Zool.zhur. 39 no.7:1032-1038 J1 '60. (MIRA 13:7)

1. Ukrainian Research Institute of Plant Protection, Kiev.  
(Wireworms)



DOLIN, V.G.

Larvae of click beetles of the genus *Athous* Esch. (Coleoptera,  
Elateridae) in the Ukrainian S.S.R. Zool. zhur. 39 no.8:1156-1168  
Ag '60. (MIRA 13:8)

1. Ukrainian Research Institute of Plant Protection.  
(Ukraine—Wireworms)

DOLIN, V. G.

Cand Bio Sci, Diss -- "Larva of the click beetle (Elaeteridae) of the Ukrainian SSR". Kiev, 1961. 16 pp, 22 on (Acad Sci UkrSSR. Inst of Zool), 180 copies, No charge, 10 works by the author listed at end of text (KL, No 9, 1961, p 179, No 24303). [61-54849]

DOLIN, V. G.

"Ekologie und bekämpfung der drahtwurmer in der Ukraine."

report submitted for 12th Intl Cong of Entomology, London, 8-16 Jul 64.

PERESYPKIN, Vladimir Fedorovich; DOLIN, Vladimir Gdaliich.  
YEFIMOV, Gendrikh Aleksandrovich; LOB'V, Viktor  
Pavlovich; LOPATIN, Valentin Matveyevich;  
MEL'NICHUK, Aleksandra Semenovna; CHERNOV, N.F.,  
red.

[Present-day chemical means for plant protection  
(pesticides)] Sovremennye khimicheskie sredstva za-  
shchity rastenii (pestitsidy). Kiev, Urozhai, 1964.  
345 p. (MIRA 18:1)

BOJIN, Vladimir Gdanovich

[Larvae of click beetles (wireworms) of the European  
part of the U.S.S.R.] Lichinki zhukov-shchelkunov; pro-  
volozhniki Evropeiskoi chasti SSSR. Kiev, Izd-vo "Urozhai,"  
1964. 206 p. (MIRA 18:5)

MARAKUSHEV, Yevgeniy Alekseyevich; DOLIN, Yevgeniy Aleksandrovich;  
OBLEZOV, Aleksandr Ivanovich; GRACHEVA, A.V., red.; VINOGRADOVA,  
G.A., tekhn. red.

[Class 85 sewing machine for hemming light fabrics developed by  
the Podol'sk Machinery Plant] Shveinaia mashina 85 klassa PMZ  
dlia podshivki tonkikh tkanei. Moskva, Izd-vo nauchno-tekhn.lit-  
ry RSFSR, 1961. 54 p. (MIRA 15:1)  
(Podol'sk--Sewing machines)

DOLIN, Ye.A.; GOROKHOV, P.K. (Moskva)

RL three-pulley band knife cutting machine. Shvein.prom.  
no.6:11-13 E-D '61. (MIRA 14:12)  
(Clothing industry--Equipment and supplies)

MAPUSTIN, I.I.; DOLIN, Ye.A. (Moskva)

Present state of fabric cutting. Shvein.prom. no.6:19-23  
N-D '62. (MIRA 15:12)

(Garment cutting)



KAPUSTIN, I.I.; DOLIN, Ye.A. (Moskva)

Studying the compression of fabrics. Shvein.prom. no.5:18-24  
S-O '63. (MIRA 16:12)

DROBINSKIY, A.D., kand.med.nauk; DOLINA, G.I. (Zaporozh'ye)

Hereditary angioneurotic edema with diencephalic crises.  
Vrach. delo no.8:142-143 Ag'63. (MIRA 16:9)

1. Kafedra nervnykh bolezney (zav. - prof. M.G.Gol'del'man)  
instituta usovershenstvovaniya vrachey.  
(ANGIONEUROTIC EDEMA) (DIENCEPHALON--DISEASES)

DOLINA, G.V.

Exudative pleurisy and its role in the development of pulmonary tuberculosis. Sbor.nauch.trud.TashGMI 22:239-243 '62.

(MIRA 18:10)

1. Kafedra legochnogo tuberkuleza (zav. kafedroy - prof. I.G. Gasparyan) Tashkentskogo gosudarstvennogo meditsinskogo instituta.

DOLINA, I. I.

USSR/Miscellaneous-Production

Card 1/1

**Authors** : Dolina, I. I., Manager of the Mosenergostroy Trust

**Title** : Use of large slag-concrete blocks as a basis for further industrialization of construction.

**Periodical** : Mekh. Trud. Rab., 2, 36 - 39, March 1954

**Abstract** : The use of ready-made slag-concrete blocks in the construction of buildings was the basis for the establishment of industrial enterprises manufacturing such large blocks. The blocks are considered a cheaper substitute for regular brick and just as durable in construction. The production of large slag-concrete blocks in the USSR is described. Photos showing the manufacture of blocks as well as laying of blocks in construction work are included. Graphs, Photos.

**Institution** : .....

**Submitted** : .....

DOLINA, I.I.

Manufacture of large slag concrete blocks using electric heat processing.  
Gor.khoz.Mosk. 28 no.3:15-18 Mr '54. (MLRA 7:6)

1. Upravlyayushchiy trestom "Mosenergostroy".  
(Concrete blocks) (Electric heating)

UHLIR, Jaromir; POTRUSIL, Bohumil; HANZL, Josef; HEJLOVA, Zora; PERESTY,  
Stanislav; SEDLARIK, Karel; DOLINA, Jiri

Reconstruction of tips of cardiac valves. Rozhl. chir. 41 no.5:306-  
312 '62.

1. II chirurgická klinika lékařské fakulty University J.Ev.Purkyně  
v Brně, přednosta prof. MUDr. Jan Navrátil.  
(HEART VALVES surg)

UHLIR, Jaromir; UHLIR, Miloslav; SEDLARIK, Karel; MEUZEK, Maxilian;  
DOLINA, Jiri; RICHTER, Josef

Replacement of a part of the wall of the urinary bladder with terylene  
tissue prosthesis. Str. med. fac. med. Brno. 35 no.4:161-164 '62.

1. II. chir. klinika v Brne, prednosta prof. dr. Jan Lavratil II.  
gynecolog. klinika v Brne, prednosta doc. dr. Uher.  
(BLADDER surgery) (PLASTICS)

NEVSTRUYEVA, V.S.; DOLINA, L.A.; SOKOLOVA, T.A.

Changes in the central nervous system in hyperthyroidism: an experimental study. Probl. endok. i gorm. 11 no. 4-83-88  
Jl-Ag '65. (USSR 18-11)

1. Eksperimental'nyy otdel (zav., prof. F.D. Vasilenko) Tsentral'nogo nauchno-issledovatel'skogo instituta karortologii i fizioterapii (dir., kand. med. nauk G.V. Pospelova) Ministerstva zdravookhraneniya SSSR, Moskva.



DOLINA, L.A.

Morphological changes in the central nervous system due to the  
action on the body of one centimeter waves; experimental study.  
Ark. pat. 23 no. 1:51-57 '61. (MIRA 14:1)  
(NERVOUS SYSTEM) (MICROWAVES—PHYSIOLOGICAL EFFECT)

DOLINA, L.A. (Moskva)

Pathomorphology of the central nervous system in experimental  
atherosclerosis in dogs. Arkh.pat. no.7:42-49 '62. (MIRA 15:9)

1. Iz patomorfologicheskoy laboratorii (nav. - kand.med.nauk  
G.K. Gersamiya) eksperimental'nogo otdela (nav. - prof. F.D.  
Vasilenko) Tsentral'nogo nauchno-issledovatel'skogo instituta  
kurortologii i fizioterapii Ministerstva zdravookhraneniya  
SSSR (dir. - kand.med.nauk G.N. Pospelova).  
(ARTERIOSCLEROSIS) (NERVOUS SYSTEM)

LEYTES, F.L.; DOLINA, L.A.; KAPLAN, N.A.

Effect of novocaine electrophoresis on changes in the action  
of lipolytic enzymes in experimental arteriosclerosis. Dokl.  
AN SSSR 150 no.4:909-912 Je '63. (MIRA 16:6)

1. Tsentral'nyy nauchno-issledovatel'skiy institut kurorto-  
logii i fizioterapii. Predstavleno akademikom A.N. Bakulevym.  
(ARTERIOSCLEROSIS) (LIPOLYSIS)  
(NOVOCaine) (ELECTROPHORESIS)

DOLINA, L.F.; LARGISHA, V.A.

Work practices of the flotation section at the Kuznetskaya Coal Preparation Plant. Met. i gornorud. prom. no. 6:38-40 N.S. 1963.

(MIRA 18.1)

DOLINA, L.F.; KULAKOV, A.A.

Modernizing the unit for drying ammonium in a fluidized bed. Biul.  
tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch, i tekhn.inform 17 no.7:  
21-22 -J1 '64. (MIRA 17:10)

1. DOLINA, L. P. and MARKUNSKIY, V. S.
2. USSR (600)
4. Bragunskiy Range - Geology, Structural
7. Report on the activities of the electric geophysical exploration party No. 3/44 and the magnetometric party No. 7/44 in the region of the western submergence of the Bragunskiy Range. (Abstract.) Izv.Glav.upr.geol.fon. no. 3, 1947.

9. Monthly Lists of Russian Accessions, Library of Congress, March 1953, Unclassified.

DAKHNOV, Vladimir Nikolayevich; DOLINA, Lyubov' Petrovna. Prinimel  
uchastnye Larionov, V.V.. BEKMAN, Yu.K., vedushchiy red.;  
FEDOTOVA, I.G., tekhn.red.

[Geophysical methods for studying oil and gas reservoir rocks]  
Geofizicheskie metody izucheniya neftegazonosnykh kollektorov.  
Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry,  
1959. 267 p. (MIRA 13:2)  
(Petroleum geology) (Gas, Natural--Geology)  
(Prospecting--Geophysical methods)

DOLINA, L.P.

Determination of the porosity, permeability, and oil content of rocks based on geophysical well data and the evaluation of oil reserves. Trudy VNI no.20:75-105 '59. (MIRA 12:10)  
(Petroleum geology)



DOLINA, L.P.; IVANCHUK, L.F.; BARANZINA, V.A.

Introducing geophysical methods of determining reservoir characteristics of strata as a basis for calculating oil resources and analyzing the exploitation of oil deposits. Trudy VNII no.29:103-112 '60.  
(MIRA 13:10)

1. Vsesoyuznyy neftegazovyy nauchno-issledovatel'skiy institut.  
(Oil well logging, Electric)

MELIK-PASHAYEV, V.S.; KOCHETOV, M.N.; KUZNETSOV, A.V.; ~~DOLINA, L.P.~~;  
Prinimali uchastiye: BELYAYEVSKIY, A.A.; LISUNOV, V.R.;  
NEYMAN, V.Ye.; CHERNOGLAZOVA, T.Ya.; MAMUNA, V.N.; ZHDANOV,  
M.A., prof., red.; PERSHINA, Ye.G., ved. red.; YAKOVLEVA,  
Z.I., tekhn. red.

[Methods for determining the parameters of oil and gas pools  
for appraising their reserves in platform-type fields using  
the volumetric method] Metodika opredeleniya parametrov za-  
lezhel' nef'ti i gaza dlia podscheta zapasov ob'emnym metodom;  
na mestorozhdeniyakh platformennogo tipa. [By] V.S.Melik-  
Pashaev i dr. Pod red.M.A.Zhdanova. Moskva, Gostoptekh-  
izdat, 1963. 269 p.

(MIRA 16:5)

(Oil reservoir engineering)

USSR/Human and Animal Physiology. Digestion.

T

Abstr Jour: Ref Zhur-Biol., No 8, 1958, 36589.

Author : Dolina, O.A.

Inst :

Title : Compensatory Processes in the Organism After Extensive Resection of the Intestine.

Orig Pub: Sov. meditsina. 1957, No 7, 101-105.

Abstract: Extensive resection of different segments of the intestine for acute intestinal obstruction or neoplasms was followed on the third and fourth day postoperatively by profuse diarrhea in the majority of 22 patients. By adhering to strict diets, the diarrhea continued for two weeks. With deviation from diet a secondary diarrhea recurred in some patients for 1-3 months. Compensatory adjustment of the intestine

Card : 1/2

USSR/Human and Animal Physiology. Digestion.

T

Abs Jour: Ref Zhur-Biol., No 6, 1958, 36589.

developed slowly in the course of the first 2 years post-operatively.

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